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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,850	01/05/2004	Byung Jin Ahn	P68311US1	2485
136	7590	08/12/2004	EXAMINER	
JACOBSON HOLMAN PLLC 400 SEVENTH STREET N.W. SUITE 600 WASHINGTON, DC 20004			NGUYEN, DAO H	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/750,850

Applicant(s)

AHN ET AL.

Examiner

Dao H Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 10/287,781.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 0104.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. In response to the communications dated 01/05/2004 through 05/06/2004, claims 1-8 are active in this application as a result of the cancellation of claims 9-40 in the Preliminary Amendment.

### **Acknowledges**

2. Receipt is acknowledged of the following items from the Applicant.

Information Disclosure Statement (IDS) filed on 01/05/2004 and made of record as Paper No. 0104. The references cited on the PTOL 1449 form have been considered.

### **Foreign Priority**

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the parent application 10/287,781, filed 11/05/2002.

### **Specification**

4. The specification has been checked to the extent necessary to determine the presence of possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### **Claim Rejections - 35 USC § 112**

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 7, the limitation "a contact plug formed to be electrically connected with the source region, and the first and second drain regions" is vague and not clear. How can one contact plug being connected to all the drain as well as the source regions? Are those regions electrically connected to each other by such plug?

### **Claim Rejections - 35 USC § 102**

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

8. Claim(s) 1 and 5-8 is/are rejected under 35 U. S. C. § 102 (e) as being anticipated by U.S. Patent No. 6,433,384 to Hashimoto.

Regarding claim 1, Hashimoto discloses a flash memory cell, as shown in figs. 10-12, 17-18, comprising:

- a tunnel oxide film 105 formed at a given region of a SOI substrate 101 (fig. 18);
- a floating gate 106 on the tunnel oxide film 105;
- a dielectric film 107 on the floating gate 106;
- first and second channel regions at the SOI substrate below both ends of the floating gate 106;

- a source region 113 formed between the first and second channel regions;

- first and second drain regions 112 at the SOI substrate 101 at both sides of the floating gate; and

- a word line 108 formed on the dielectric film 107,
- wherein data of two bits or four bits are stored at a single cell by individually injecting electrons into the floating gate on the first and second channel regions or discharging the injected electrons, depending on voltages applied to the source region, the word line, and the first and second drain regions (this is inherent because charge in the floating gate above each channel region can be technically stored or discharged by

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applying voltages to the source/drain and the gate electrodes, the value(s) of the charge(s) depend(s) on the values of the voltages applied to the electrodes).

Regarding claim 5, Hashimoto discloses the flash memory cell comprising all claimed limitations. See figs. 10.

Regarding claim 6, Hashimoto discloses the flash memory cell further comprising a device isolation film 114 formed on the first and second drain regions, wherein the floating gate is separated by the device isolation film. See figs. 11.

Regarding claims 7-8, Hashimoto discloses the flash memory cell comprising all claimed limitations. See figs. 1, 12, 13.

### **Claim Rejections - 35 U.S.C. § 103**

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim(s) 2-4 is/are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 6,433,384 to Hashimoto, in view of the following remarks.

Regarding claim 2, Hashimoto discloses the flash memory cell comprising all claimed limitations, except for the floating gate being consisting of a nitride film.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Hashimoto so that the floating gate being consisting of a nitride film, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. Moreover, nitride is a common material which is used to form a floating layer due to its great property of charge trapping or charge holding.

Regarding claims 3-4, though Hashimoto does not specifically teach that the source/drain and/or channel regions being formed of either p-type or n-type, it would have been obvious to one having ordinary skill in the art at the time the invention was made that choosing a memory device with a p-channel or an n-channel is just a matter of design choice, it depends on the requirement of uses of the device. This definitely does not have a patentable weight.

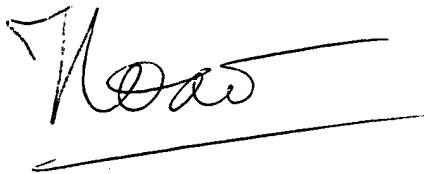
### **Conclusion**

11. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571)272-1787. The fax numbers for all communication(s) is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

A handwritten signature in black ink, appearing to read 'Dao H. Nguyen', with a long horizontal line extending from the end of the signature.

Dao H. Nguyen  
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August 03, 2004

A handwritten signature in black ink, appearing to read 'Hoai Ho', with a long horizontal line extending from the end of the signature.

HOAI HO  
PRIMARY EXAMINER